LIVING AND WORKING AT LOS ALAMOS

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Foreign born scientists have made important contributions to both science and the security of the USA. Between 1930 and 1960 the majority were from Europe. Their contributions to the Manhattan Project and to the creation of the modern technological society are unparalleled. To me what is equally significant is that since WWII, Europe and North America have had peace, and have developed a common set of values and cooperation. I believe the camaraderie of the intellectual elite played a significant role in overcoming fears and suspicions on both sides. Today, the majority of foreign born scientists are from Russia, Eastern Europe, China and India. There also are significant numbers from the Arab world. My hope is that this demographic shift, reflecting a globalization of science and of shared values and aspirations at least in the minds of the most educated people from all countries, will lead to global peace and cooperation. I, therefore, view the role of foreign nationals working at Los Alamos to include creating a just and equitable global society and not just generating scientific publications and patents.

Let me start by giving a very short biography from the perspective of this meeting – I am previous foreign national, now a citizen, working at a nuclear defense lab. I was born and raised in India and came to the US in 1975 after receiving a master's degree in physics from Delhi University. I got my Ph.D. from Caltech in 1982 and joined LANL in 1985 after a post-doc in Boston. I came to LANL on an H-1 visa, converted to permanent resident status in Feb 1989, and became a naturalized US citizen in May 1999.

Today, I would like to share my experiences and views on the scope and opportunities for doing excellent science at LANL and contributing to its overall vitality and mission. My approach will be highly personal and anecdotal. I would like to use, as examples,

my activities outside of High Energy Physics because my principal research endeavor is at one extreme end of what LANL does. Stated very briefly the goal of my research has been to elucidate the properties of quarks and gluons, elementary particles that make up protons and neutrons, and to validate Quantum Chromo Dynamics as the theory of strong interactions. The other story, which I would like to share, is also colorful, and illustrates what passion (coupled with scientific talent) can achieve.

I first visited Los Alamos in 1984 and immediately fell in love with the area and with LANL as a place to do science. The match between my wanting to solve QCD using large scale computing and Los Alamos's stature as a center of high performance computing was ideal. So when I was offered a JRO fellowship in 1985 I accepted because

- I love the outdoors and mountains in particular. Los Alamos and its surroundings are idyllic in my world view.
- LANL offered me a chance to do great science.
- LANL offered me access to world's best and largest computing resources.
- My sponsors and collaborators wanted me here.
- A JRO position is regarded as a gateway to a TSM position, so I felt I had long term options.
- At that point in time I was to very large extent oblivious of, and impervious to, politics and institutional problems.

During the 18 years that I have spent at LANL, my expectations of LANL have, by and large, been met. If I have not succeeded commensurate with my ambitions, it has been mostly because of my own limitations. A great bonus of working at LANL has been living in Los Alamos. I can say without any reservations that over the last 18 years I have not been depressed by the weather or by the surroundings with the sole exception of the fire in 2001 which I regard as an exceptional circumstance. I enjoy living here. In

retrospect, my reasons for why LANL has been a great place to do science and live are

- For the first fifteen years I could work 14 hours a day, 365 days a year, without distractions.
- I had access to computational resources that were world class.
- I had funding to bring visitors and collaborators to LANL. Collaborators loved coming here as we got a lot done, and they enjoyed the area.
- I could team up with exceptional people in the Theoretical and Computing Divisions to harness new emerging high performance computers.
- My family and I live surrounded by beauty and there are lots of outdoors activities for family and kids.
- A great place to live and raise a family

What has made my life especially enjoyable is being part of the Theoretical Division and of T-8 in particular. Demographically, T-Division is a kaleidoscope in terms of diversity in background and thought, and a classic example of a dynamic melting pot. It is a wonderful enriching experience to be surrounded by, and constantly challenged by, colleagues who are smarter than you, and who, no matter what the topic of discussion, have very perceptive comments and deep insights; working in a place where scientific integrity and honesty is demanded at all times; where, future colleagues are selected after an extensive search, decisions are based on quality and promise and without discrimination; and where, even post-doctoral fellows are treated as equals, allowed to blossom and encouraged to define and lead their own research.

From what I hear, this environment is not the rule at LANL. Also, many TSM have expressed concern that since about 1990 the priorities have shifted from science to process, doing good science is being clouded by expediency of funding, and the increased day-to-day stress is making many talented people dysfunctional. I

believe that a productive environment results as a consequence of an uncompromising quest for excellence. The lesson I have learned is that it takes hard work, commitment, and vision on the part of many to expect, create, and value an invigorating environment in all areas of an organization – technical, management and support.

I feel strongly that we need to renew our commitment to science and excellence because my experience in doing research in fundamental science at LANL indicates that, since about 1990, the priority is shifting from science to process, science is getting clouded by issues of funding, and there is increased stress to the point that many productive people are becoming dysfunctional.

Throughout my 18 years at Los Alamos I have gotten involved in a number of causes. My involvement has been driven by a passion for doing what I feel is right, by wanting to make a difference, and as payback – my dues for the wonderful opportunities that I have been given. Throughout this time I have tried to fight for issues and not personalities. I have tried to make things happen and at the same time stayed away from pushing self-serving agendas. My intentions have not always been taken for what they were, but that I regard as part of pushing the envelope. I have at times been accused of being self-centered. There is truth in that.

My passion was first aroused in 1988 when I came within an hour of being declared illegal as my H-1 visa had run out, losing my job, and being asked to leave the country. I became painfully aware that the Lab did not have a friendly and helpful immigration office. So I had to educate myself in immigration law, fight my battle to get the Green card and survive. Having survived, I pushed the system and agitated for in house immigration expertise. Luckily, the system responded and we got immigration specialists on board. Many of you will remember Jim Nesmith with fondness and gratitude. In helping create that system I thought I had done something. Fortunately, the generosity and concern that Nesmith

exhibited over time taught me what a truly remarkable human being one can be.

I have always been a firm believer in parallel computing since my days at Caltech where the Cosmic Cube was developed to do lattice QCD. So from the day I got to LANL I pushed for parallel computing. I remember going around trying to convince people that Cray computers offered the slow evolutionary development stream, whereas massively parallel computers were revolutionary and the way of the future. There were many detractors and cynics, and many who said the "right" words but had no belief at the gut level. The timely "dumping" of a very expensive but clearly flawed architecture machine, the FPS-T200 computer, into the lap of CIC Division was very fortunate. Jerry DeLapp and I harnessed it to do excellent science, and thus gained credibility to speak in this arena. In 1988-89, Thinking Machines announced the CM-2 and I wanted one here. To precipitate matters I wrote a personal check for $1000 and asked for a $25,000,000 machine to do Lattice QCD in collaboration with Ralph Brickner. Norm Morse, Division Director for CIC, was swayed and LANL got the largest CM2. Concurrently, Andy White had been lobbying for a center to make a broad based effort in parallel computing (for both open and programmatic computations) and his efforts resulted in the formation of the ACL as part of the DOE high performance center. The CM2, and later the CM5 and the SGI Origin 2000, became centerpieces in the success story of the ACL under Andy's leadership. The result was LANL became a leader in Parallel High Performance Computing.

In 1999, with the end of the ACL as a HPC center and my computing allocation with it, my eyes were opened to the dire need for the availability of High Performance Computing for a whole array of scientists working in the open and on non-programmatic problems. With the advent of cluster computing, it became clear that even faculty at State Universities had more computing

resources. To me, expertise in a wide range of computational science, simulations, and computer science was a niche that LANL could not afford to loose. So, in 2001, I started to build a case for open computing by collecting testimony of need and opportunity. Sixty scientists responded and we had a case. I lobbied and on a couple of occasions pushed my point very hard and aggressively in front of those who have learned to deal with wise-asses by ignoring them. (I did learn to be more effective in the end!) Fortunately, Andy, and many others, also lobbied, each in our own ways. The result is we now have an institutional program for open High Performance Computing and state-of-the-art resources.

A major transition in my life occurred in the beginning of 1999. Subsequent to a visit to India with my family, my eyes opened to the state of the world. The tremendous opportunities enjoyed by the HAVES, of which I am one, and the desperation and void of the HAVE-NOTS is not a sustainable or a humane situation. I got involved by becoming a HIV/AIDS educator and modeler, volunteered my time to work with school students in Los Alamos and in India, and started working with the NM Department of Health. Over time I became aware of the needs of, and dismal future faced by the global poor and started to see the issues through the eyes of villagers in India. My efforts have evolved from just HIV education to a more holistic involvement in the delivery of health and education. In this enterprise my teachers continue to be school students and the global rural and poor populations.

In thinking about global problems of health and education, I also became aware of the role that national security plays in development. Even a cursory look at the many failing/failed countries should convince everyone that security is a pre-requisite for development. This led me to initiate the “International Security in the New Millennia” seminar series at LANL in January 2000. The goal was to invite speakers to discuss a wide variety of issues that impact security and the quality of life globally. In time I

developed two seasoned collaborators – Terry Hawkins and Sig Hecker – who have constantly reassured me that such a broad look at security and development issues is important to pursue at Los Alamos. In 2001 we became bolder and proposed and developed the Los Alamos Strategic Studies Program. Its aim was to develop the next generation of broad strategic thinkers. I presume that some of you have attended one or both of the workshops in this series: "Confronting Terrorism – CT2002", and "Nuclear and Conventional Forces: Issues for National Security, Science and Technology". Others workshops in this series are on the drawing board.

Around the same time I became aware of how isolated and insular LANL had become. My attempt to nominate someone as a Director's Colloquium speaker exposed the fact that, even in something supposedly as high profile as these colloquia, the LANL community was not engaged. So I spoke out and within a few months found myself on the committee. Now you can hold me responsible for all the poor colloquia and the system.

The one defining incident of my stay at Los Alamos that I have been ambivalent about is the Wen Ho Lee case. Not knowing all the details, thinking about it is almost like dealing with religion. One simply wants to believe and have faith in the system. In the end I have come to believe that the system did injustice to Wen Ho by imprisoning him in solitary confinement for close to a year, and yet at the same time I cannot understand why an intelligent person would do things that were in such clear violation of security guidelines and procedures, and which anyone with Q clearance has willingly accepted to follow and uphold. The incident continues to bother me and keeps me wary of zealous and dogmatic people. The bottom line, which I do not wish to be construed as a lame excuse for ambivalence, is the acceptance that the world can be unfair at times and that there is no such thing as a completely level playing field. Given the state of the world, all of us who have opportunities,

freedoms, and food on the table have to work extremely hard to make life better and safer for all in whatever way we can be effective.

In 2002, I was “forced” to take management courses. Apart for information on procedures and guidelines, and a few isolated nuggets, I found the courses boring. Everyone attending these courses came in with the conviction that the system is broken and the problem lies with the “upper management” and just about everyone else in the system. Without fail, each of us regarded ourselves as an exception. While I do, to a large extent agree that the system is broken, I realized, listening to others (who I now heard clearly as mirroring what I had also been saying) that we were all stuck in a well worn groove. So I decided to read some of the literature on management, leadership and interpersonal skills on my own and bared myself to deep self criticism. On the proactive side and to help the training program, I wanted to add something that would help expose the denial we all live with – we all complain and can spot flaws in the system but very few of us are able to solve problems effectively if put in a position of responsibility. So, Sarah Michalak, John Zondlo and I added, to a one day training course in negotiation skills, a day long game scenario. Even in that simulated environment, it became apparent to players how subtle and difficult to implement these seemingly obvious skills are and how we routinely fail in even simple interpersonal negotiations. Never mind what I learned about “management” from the courses or this exercise, my getting involved and thinking about management courses and by subjecting myself to painful self-criticism has had a grand payback – I am a better colleague, friend, husband, and parent.

A pet peeve throughout my stay at LANL has been that we should all be judged by the quality of people we hire, lobby to get hired, or nurture. So far I am proud to have brought four excellent people who blossomed at LANL.

- Tsutomo Shimamura
- Paul Ginsparg
- David Daniel
- Tanmoy Bhattacharya

I am sure these names will draw varied responses – and I will let you draw your own conclusions and grade me. I feel strongly that if there is one thing that each one of us must do while working at any institution, it is to recruit and retain people who are significantly better than us.

In short, and overall, I have had fun during these last 18 years. I am grateful to the many opportunities that I have been given and am disappointed in myself for the many I have missed. I am sure I have pissed off many people during this time, but I have always tried to speak honestly and be passionate about what I believe in. I am very lucky to have worked and cohabited with many excellent people. Some people have touched me deeply and many have shaped me. All I can say is I have just begun to realize how much I need to grow and to explore the rich world around me. So I will end with a war cry – I will continue to fight for excellence in science, for a very broad base of science at LANL, to make LANL a great place to do science, and to positively impact our shared global existence. I sincerely hope that all of you make a similar commitment, independent of your roots and technical skills, so that we can work together to realize this vision.